Bottcher, Helen

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Sent: Tuesday, December 01, 2015 10:50 AM
To: Bottcher, Helen; Ken.Scheffler@CH2M.com; Richard Brooks; Toy, Mark C (DOH); Edwards, Susannah (ECY)
Subject: Wyckoff Stormwater Outfall Dilution Evaluation
Attachments: Wyckoff dilution.pdf

Presented below are example dilution results for the Wyckoff stormwater outfall. Based on model runs not shown here, I have selected/assumed a 6-port, 6" diameter diffuser. This configuration resulted in an effluent velocity in the range of 10 fps. The receiving water current velocities and density profiles were taken from the 1995 Dilution Report. UM3 was used to evaluate the initial dilution and Brook's Linear Diffusivity was used to evaluate the farfield dilution. Acute dilution is based on the 10th percentile current velocity, 0.5 cm/sec. Chronic dilution is based on the 50th percentile current velocity, 3 cm/sec.

I have included an attachment showing the UM3 printouts and the Brook's printout for one dilution run. Please let me know if you have any questions.

1. **Initial dilution runs to determine port spacing**

Q – 9 cfs
Port Dia – 6"
Port Contraction Coeff – 0.6
Port Vertical Angle – 45 degrees
No. of Ports – 6
Current Velocity – 3 cm/sec, 50th percentile
Winter Months – no density stratification

Acute Dilution Boundary – 7.1 meters
Chronic Dilution Boundary – 70.75 meters

Port Spacing (m) Chronic Dilution

1. 86
2. 125
3. 151
4. 169

2. **Based on the above, will use a port spacing of 2 meters for subsequence dilution runs.**

Q – 9 cfs (25-year, 24-hour storm event)

Summer Months (max density stratification)	Current Velocity (cm/sec)	Acute Dilution	Chronic Dilution
	0.5	42	
	3		112

Winter Months (no density stratification)	0.5	46
	3	125

Q – 11.06 cfs (100-year, 24-hour storm event)

Summer Months (max density stratification)	0.5	36
	3	104
Winter Months (no density stratification)	0.5	39
	3	115